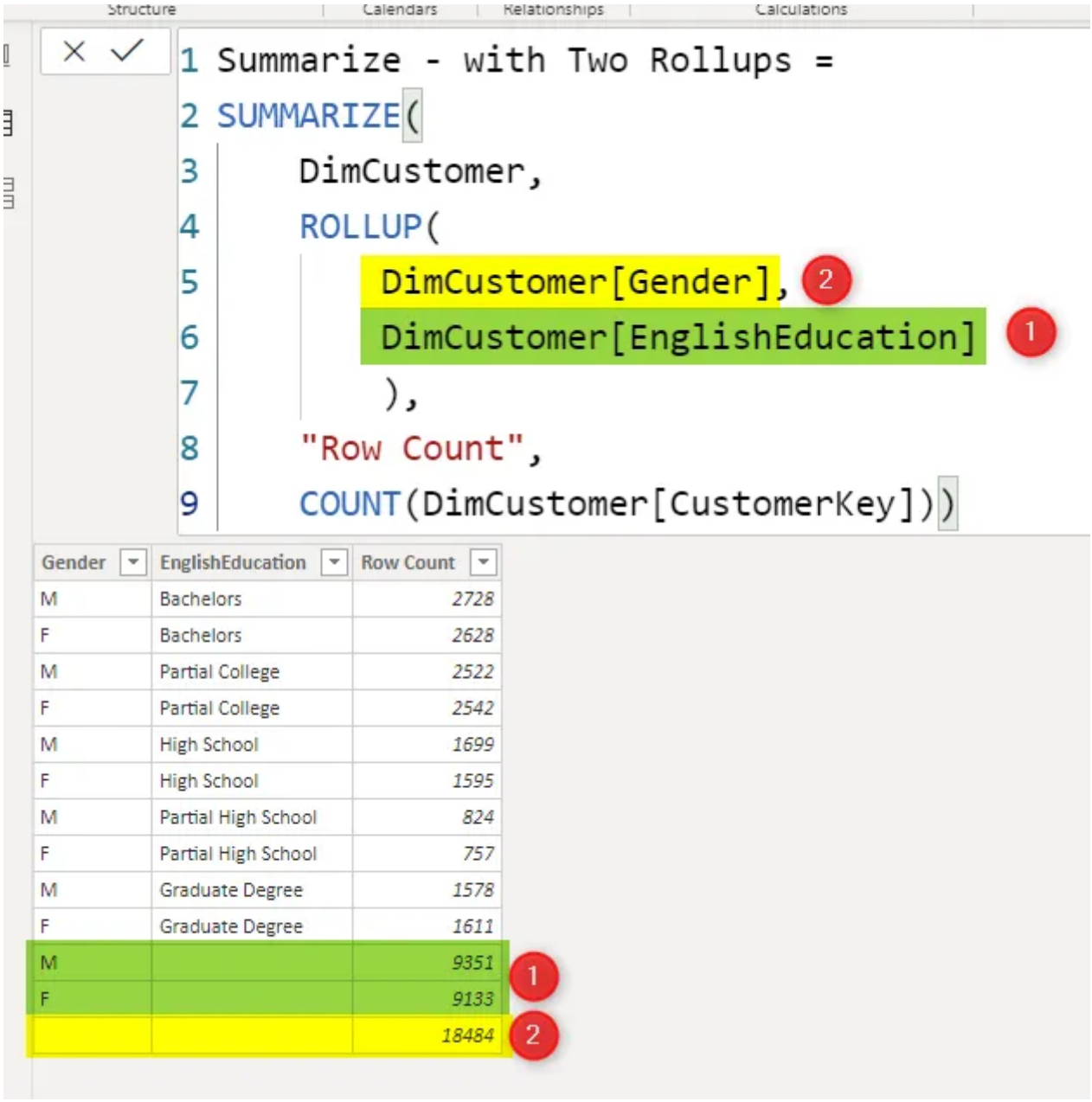
Aggregated Table in Power BI with Extra Options – Summarize Function in DAX

Posted on *March 31, 2020*



Gender	EnglishEducation	Row Count
M	Bachelors	2728
F	Bachelors	2628
M	Partial College	2522
F	Partial College	2542
M	High School	1699
F	High School	1595
M	Partial High School	824
F	Partial High School	757
M	Graduate Degree	1578
F	Graduate Degree	1611
M		9351
F		9133
		18484

In the previous article, I explained how you can use GROUPBY function in DAX to create an aggregated table. In this article, I'll explain how you can use Summarize function for the same purpose. Summarize function gives you more control on how to create your aggregated table with some extra functions. Let's

see how it works. Creating aggregated tables using DAX functions is particularly very useful when creating virtual tables inside DAX measures.

Sample Dataset

My sample dataset table is DimCustomer as below;

CustomerKey	GeographyKey	CustomerAlternateKey	Title	FirstName	MiddleName	LastName	NameStyle	BirthDate	MaritalStatus	Su
11471	207	AW00011471		Latasha		Suarez	False	Tuesday, September 25, 1973	S	
11602	135	AW00011602		Larry		Gill	False	Wednesday, April 13, 1977	S	
11603	244	AW00011603		Geoffrey		Gonzalez	False	Sunday, February 6, 1977	S	
11604	275	AW00011604		Edgar		Sanchez	False	Friday, June 3, 1977	S	
11610	269	AW00011610		Blake		Collins	False	Wednesday, April 23, 1975	S	
12515	189	AW00012515		Shelby		Bailey	False	Friday, June 3, 1977	S	
12517	133	AW00012517		Alexa		Watson	False	Thursday, August 25, 1977	S	
12518	161	AW00012518		Jacquelyn		Dominguez	False	Tuesday, September 27, 1977	S	
12519	265	AW00012519		Casey		Gutierrez	False	Saturday, December 17, 1977	S	
12524	211	AW00012524		Kate		Shan	False	Friday, January 24, 1975	S	
12714	157	AW00012714		Colleen		Lu	False	Tuesday, July 17, 1973	S	
12716	185	AW00012716		Dale		Shen	False	Saturday, March 16, 1974	S	
12718	193	AW00012718		Tammy		Sai	False	Thursday, November 14, 1974	S	
12728	131	AW00012728		Jeremiah		Stewart	False	Tuesday, June 26, 1979	S	
12871	233	AW00012871		Leah		Li	False	Wednesday, October 6, 1976	S	
13671	173	AW00013671		Frank		Ramos	False	Thursday, February 7, 1974	S	
13826	127	AW00013826		Candice		He	False	Friday, November 25, 1977	S	
13830	237	AW00013830		Andrea		Cox	False	Wednesday, August 3, 1977	S	
13837	120	AW00013837		Alyssa		Lee	False	Friday, August 13, 1976	S	
13838	263	AW00013838		Jill		Rubio	False	Sunday, June 27, 1976	S	
14837	144	AW00014837		Dennis		Li	False	Sunday, July 17, 1977	S	
14838	121	AW00014838		Darren		Alvarez	False	Tuesday, July 26, 1977	S	
14839	238	AW00014839		Natasha		Sanz	False	Wednesday, May 18, 1977	S	

Summarize Function

Summarize is a DAX function that gives you an aggregated result from a table, this is how you can use Summarize function:

Summarize(<table>,<grouping column>,[<name>,<expression>])

- Table; a DAX expression that returns a table, or just one of the tables in your dataset
- grouping column; the name of the column you want to use for grouping
- name; the name of the new aggregated column
- expression; the expression to generate the aggregated column.

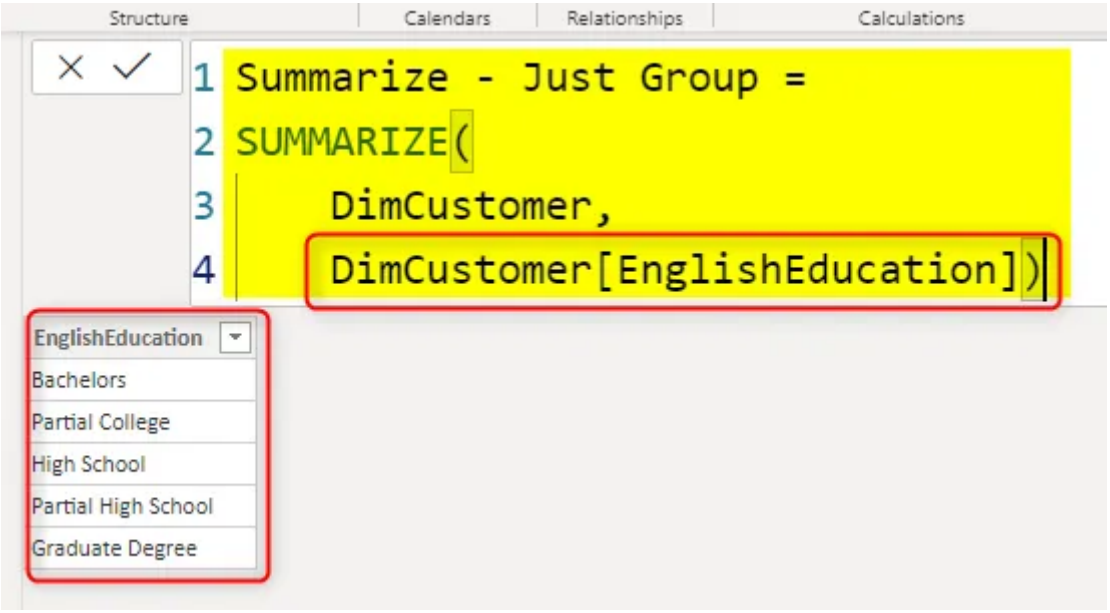
Summarize function returns a table as the output. The definition of Summarize function as above looks very similar to GroupBy. However, there are some differences. let's go through some examples, and you'll see examples of that.

Summarize: Just Grouping

The simplest way of using Summarize function is using it for only grouping, which will give us the unique list of values of a grouping column (similar to what you can achieve with DISTINCT, or VALUES functions);

```
Summarize - Just Group =
SUMMARIZE(
    DimCustomer,
    DimCustomer[EnglishEducation])
```

The expression generates the below result;

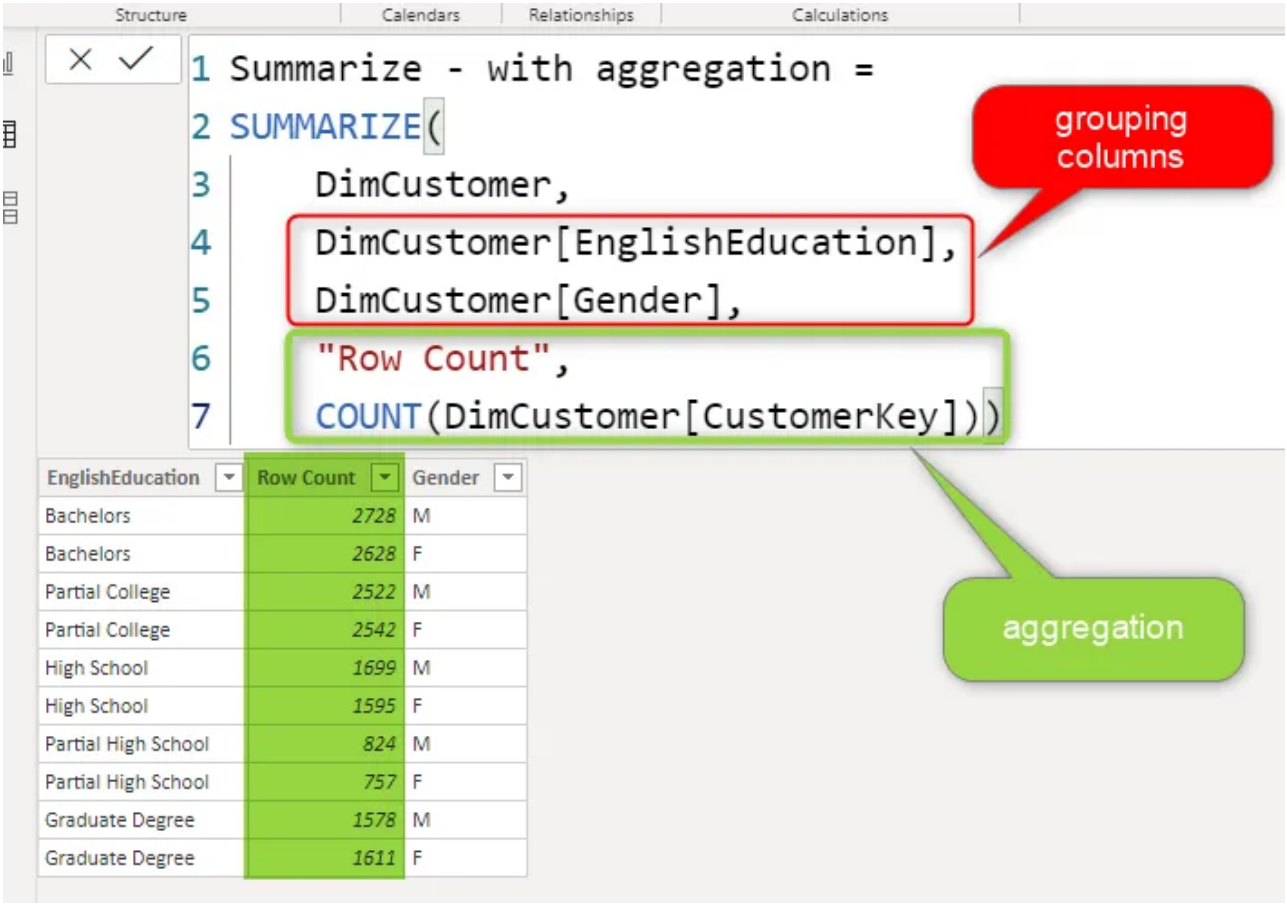


Summarize With Aggregations

Now, let's take it one step further, and use it for aggregation. And remember that you can also have more than one grouping column;

```
Summarize - with aggregation =
SUMMARIZE(
    DimCustomer,
    DimCustomer[EnglishEducation],
    DimCustomer[Gender],
    'Row Count',
    COUNT(DimCustomer[CustomerKey]))
```

In the expression above, the grouping columns are EnglishEducation and Gender. And the aggregation is the count of customers in each group. The result is the count of customers for each EnglishEducation and Gender as below;



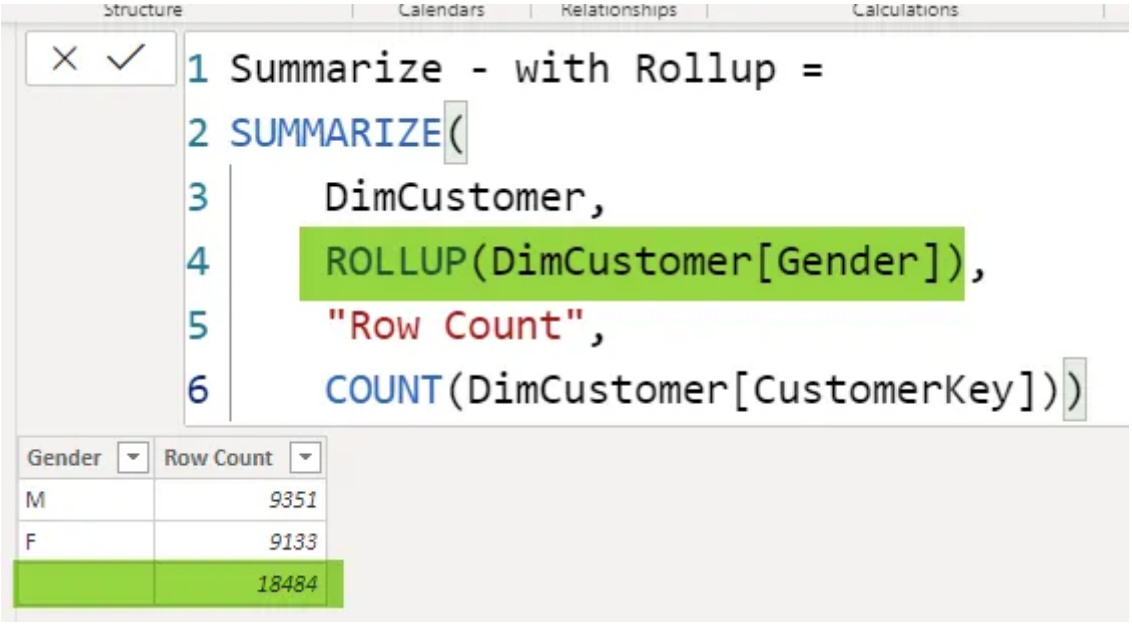
You can have more than one aggregation if you want too. Just add the name of each column and the aggregation expression.

Summarize with RollUp: Totals in the Table

So far, what you have seen was the usage of Summarize in a simple way with only grouping columns and aggregations. That usage is similar to using the GroupBy function. You can, however, using Summarize to add more options to your output table. This can be in the form of totals. Let's say, you are also interested to see the totals of categories in addition to all other results we had so far, this can be achieved using a RollUp function.

```
Summarize - with Rollup =
SUMMARIZE(
    DimCustomer,
    ROLLUP(DimCustomer[Gender]),
    'Row Count',
    COUNT(DimCustomer[CustomerKey]))
```

The above expression, not only create the aggregated result per each Gender, but it also will have one extra ROW in the table for the totals (all genders);



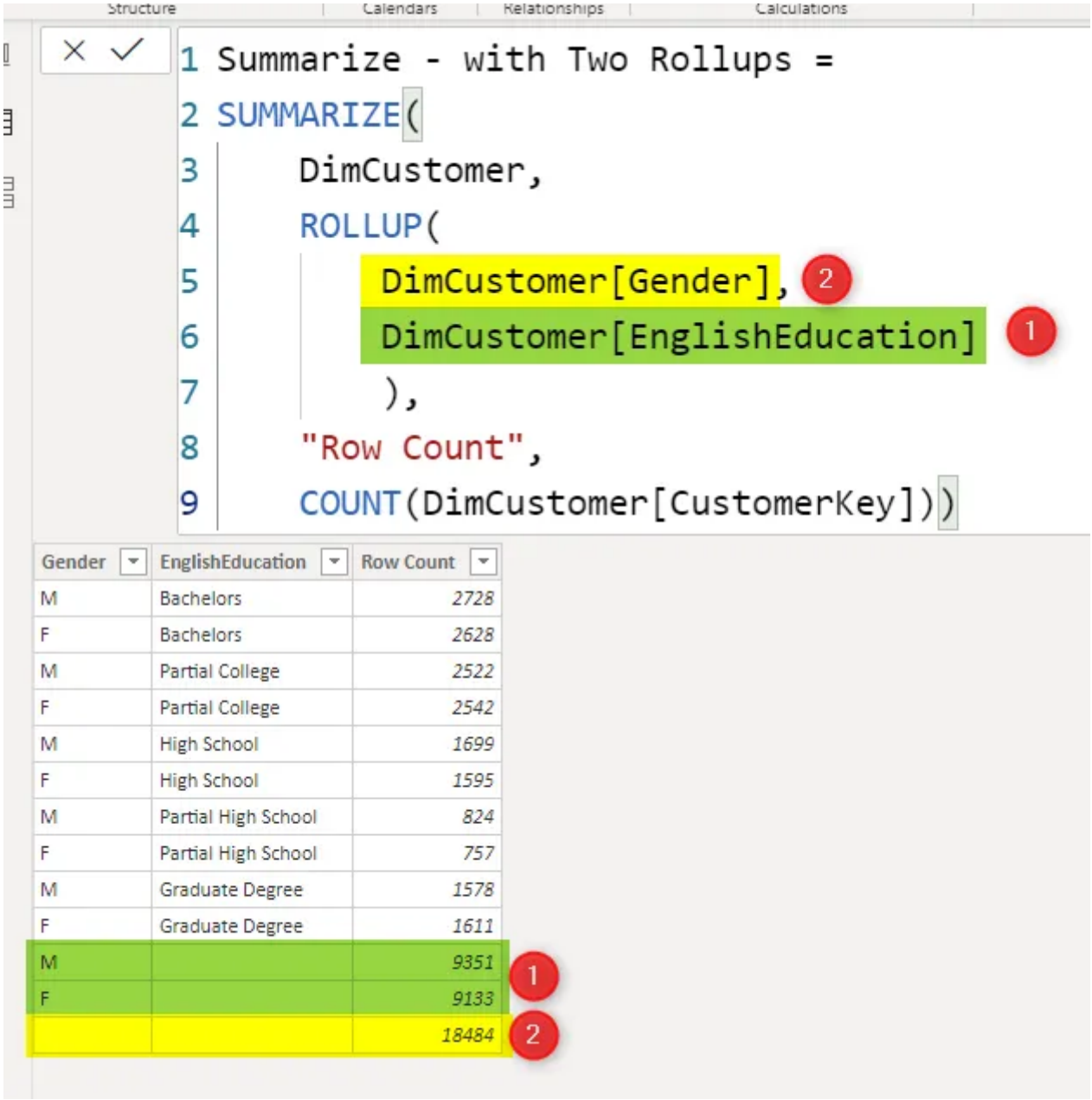
The RollUp comes in the place that the grouping column should be, and it means the grouped results, PLUS the total.

What if Two or More RollUps

Similar to a matrix way of grouping, if you have more columns inside the RollUp, Rolling up values (or total calculation let's say) is going through them one by one in the order in which they are written inside the RollUp function.

```
Summarize - with Two Rollups =
SUMMARIZE(
    DimCustomer,
    ROLLUP(DimCustomer[Gender],DimCustomer[EnglishEducation]),
    'Row Count',
    COUNT(DimCustomer[CustomerKey]))
```

This means that after doing all the grouping, roll up on EnglishEduction first, but with the grouping on Gender (highlighted green below with the number 1), and then roll up on Gender (highlighted yellow below with the number 2);



Gender	EnglishEducation	Row Count
M	Bachelors	2728
F	Bachelors	2628
M	Partial College	2522
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F	High School	1595
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F	Partial High School	757
M	Graduate Degree	1578
F	Graduate Degree	1611
M		9351
F		9133
		18484

1
2

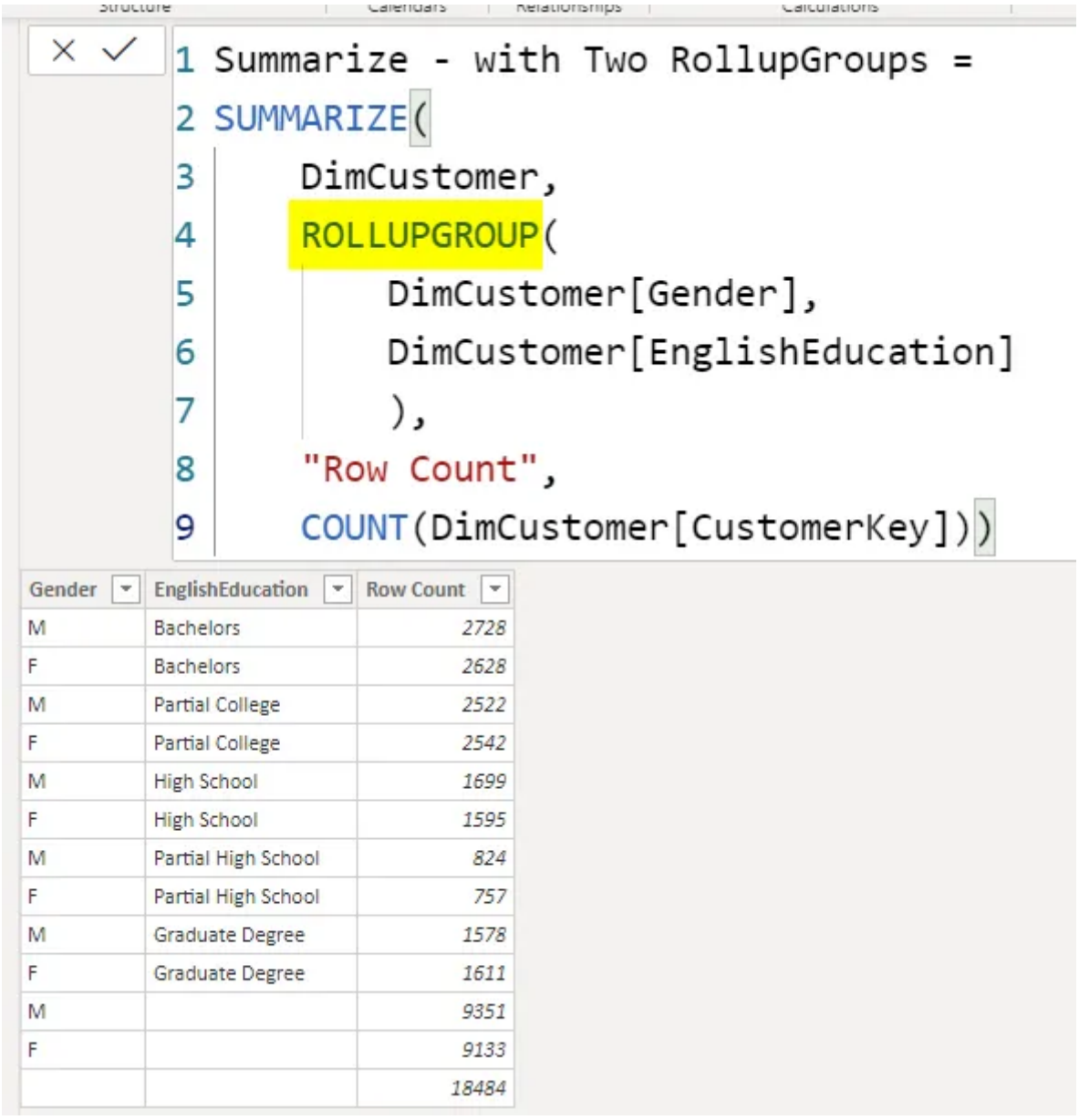
Changing the order of using columns inside RollUp will change the result of roll-up columns.

RollUpGroup

RollUpGroup can be used similarly to RollUp for bringing the totals and sub-totals into the aggregated results. if we replace the RollUp with RollUpGroup in the previous expression, we get exactly the same result;

```
Summarize - with Two RollupGroups =
SUMMARIZE(
    DimCustomer,
    ROLLUPGROUP(
        DimCustomer[Gender],
        DimCustomer[EnglishEducation]
        ),
    'Row Count',
    COUNT(DimCustomer[CustomerKey]))
```

So, you can use either RollUp or RollUp Group to get totals and subtotals.



Gender	EnglishEducation	Row Count
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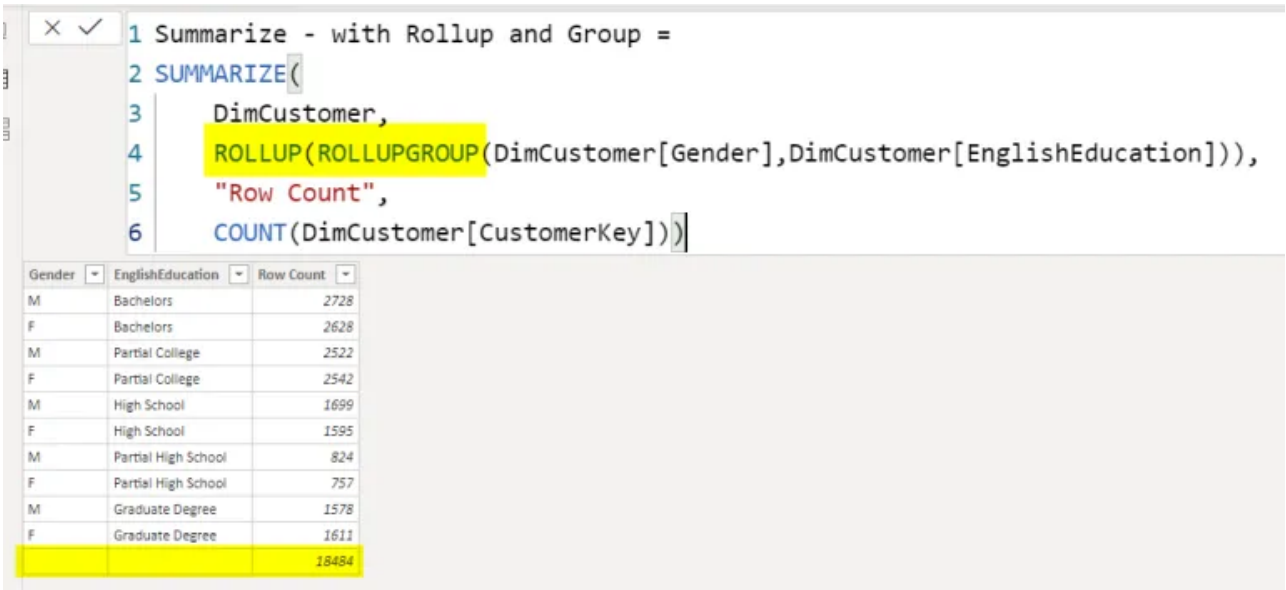
Preventing Subtotals: Combining RollUp and RollUpGroup

One of the main usages of RollUpGroup, is to combine it with RollUp, and use it as a parameter inside the RollUp function. This will lead the removal of subtotal values, and only showing the totals.

In the expression below, you can see that the RollUpGroup is used inside the RollUp function;

```
Summarize - with Rollup and Group =
SUMMARIZE(
    DimCustomer,
    ROLLUP(ROLLUPGROUP(DimCustomer[Gender],DimCustomer[EnglishEducation])
    'Row Count',
    COUNT(DimCustomer[CustomerKey]))
```

The result only shows one total Row;



Gender	EnglishEducation	Row Count
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M	Partial College	2522
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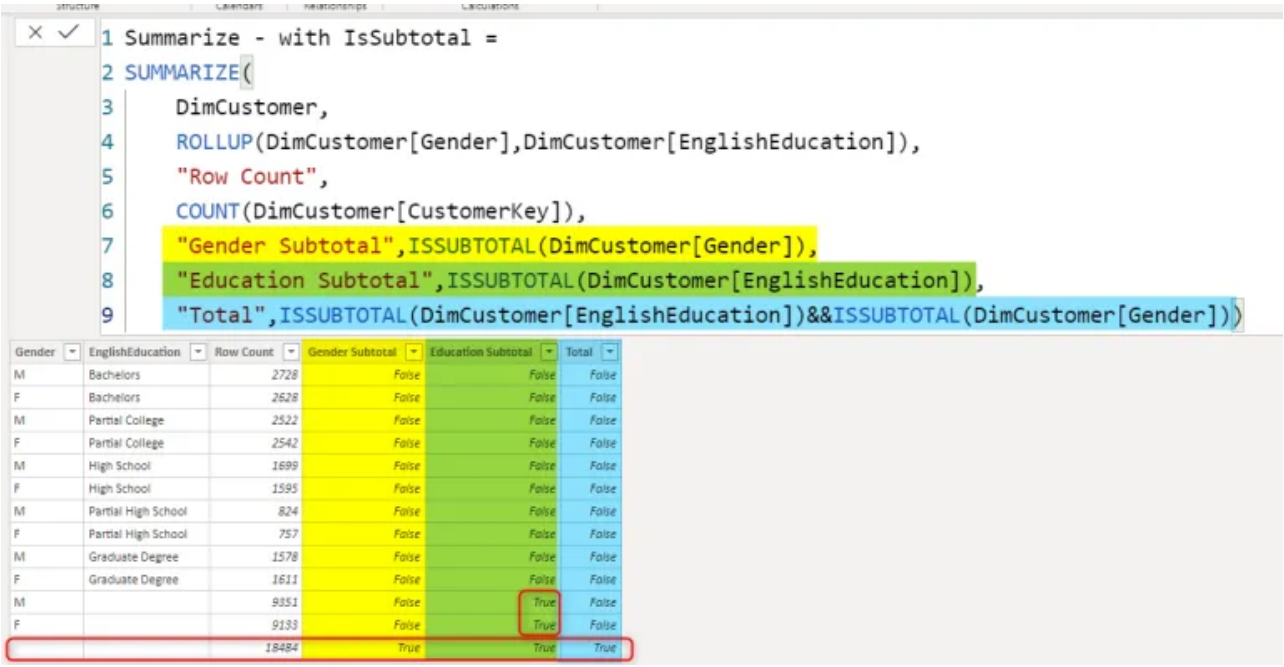
Checking if the Row is a SubTotal Row? IsSubTotal

Sometimes, you need to check in the result set, and see if this is a subtotal row or not. Let's say you want to calculate a percentage, and you want to do that only for rows that are not subtotal. There is a function named IsSubTotal, which returns True or False saying that is this row a subtotal row or not.

The expression below has three columns to check is this subtotal of Gender, Eduction or combination of both;

```
Summarize - with IsSubtotal =
SUMMARIZE(
    DimCustomer,
    ROLLUP(DimCustomer[Gender],DimCustomer[EnglishEducation]),
    'Row Count',
    COUNT(DimCustomer[CustomerKey]),
    'Gender Subtotal',ISSUBTOTAL(DimCustomer[Gender]),
    'Education Subtotal',ISSUBTOTAL(DimCustomer[EnglishEducation]),
    'Total',ISSUBTOTAL(DimCustomer[EnglishEducation])&&ISSUBTOTAL(DimCust
```

The result would have three columns showing where is the subtotal and where not



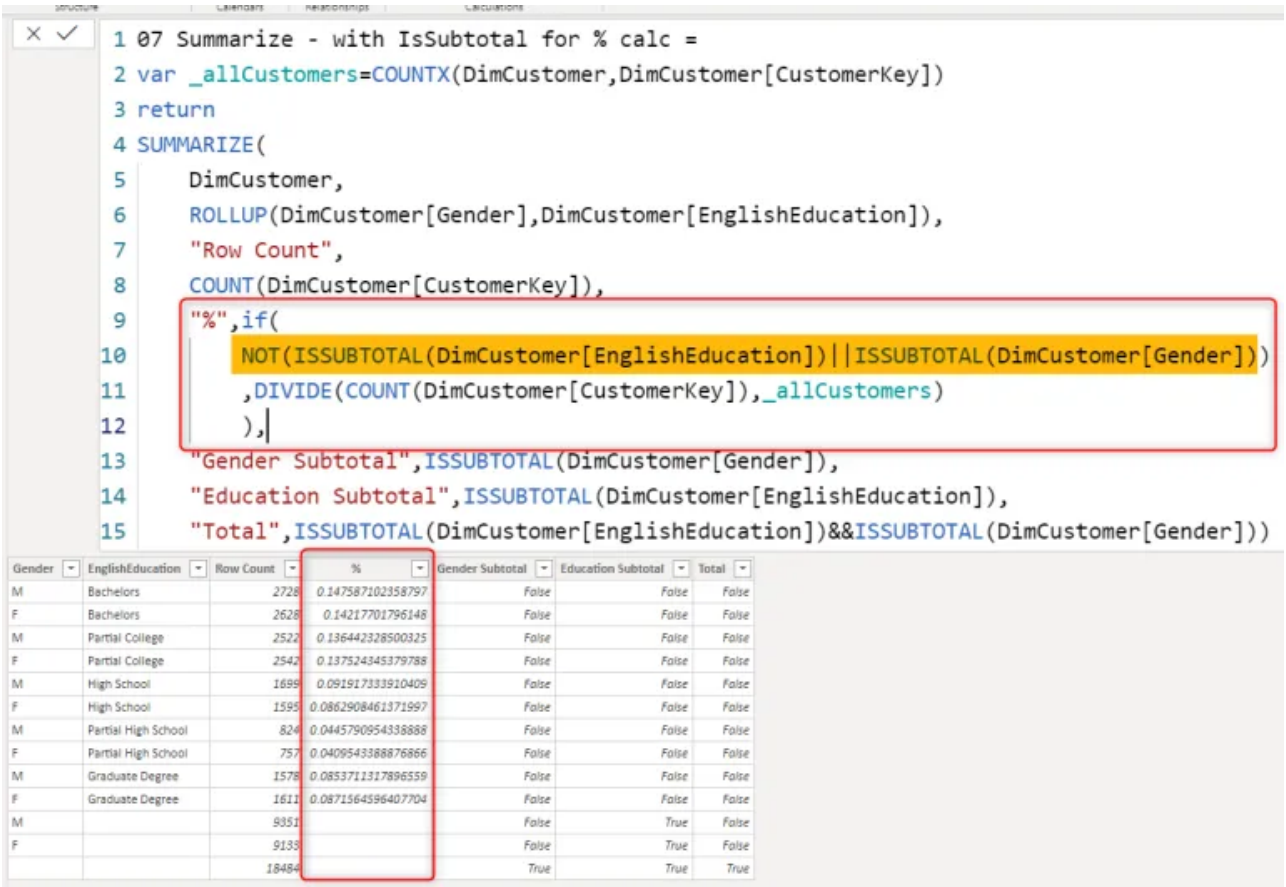
Gender	EnglishEducation	Row Count	Gender Subtotal	Education Subtotal	Total
M	Bachelors	2728	False	False	False
F	Bachelors	2628	False	False	False
M	Partial College	2522	False	False	False
F	Partial College	2542	False	False	False
M	High School	1699	False	False	False
F	High School	1595	False	False	False
M	Partial High School	824	False	False	False
F	Partial High School	757	False	False	False
M	Graduate Degree	1578	False	False	False
F	Graduate Degree	1611	False	False	False
M		9351	False	True	False
F		9133	False	True	False
		18484	True	True	True

each IsSubtotal used inside a new column, and if the result row is a subtotal on that field, then it returns true for that row.

As an example, If you want to calculate the percentage of the count of customers against the total for every row, but not for subtotal, you can do this:

```
07 Summarize - with IsSubtotal for % calc =
var _allCustomers=COUNTX(DimCustomer,DimCustomer[CustomerKey])
return
SUMMARIZE(
    DimCustomer,
    ROLLUP(DimCustomer[Gender],DimCustomer[EnglishEducation]),
    'Row Count',
    COUNT(DimCustomer[CustomerKey]),
    '%',if(
        NOT(ISSUBTOTAL(DimCustomer[EnglishEducation])||ISSUBTOTAL(DimCust
        ,DIVIDE(COUNT(DimCustomer[CustomerKey]),_allCustomers)
        ),
    'Gender Subtotal',ISSUBTOTAL(DimCustomer[Gender]),
    'Education Subtotal',ISSUBTOTAL(DimCustomer[EnglishEducation]),
    'Total',ISSUBTOTAL(DimCustomer[EnglishEducation])&&ISSUBTOTAL(DimCust
```

and the result will be like the below:



Gender	EnglishEducation	Row Count	%	Gender Subtotal	Education Subtotal	Total
M	Bachelors	2728	0.147587102358797	False	False	False
F	Bachelors	2628	0.14217701796148	False	False	False
M	Partial College	2522	0.136442328500325	False	False	False
F	Partial College	2542	0.137524345379788	False	False	False
M	High School	1699	0.091917333910409	False	False	False
F	High School	1595	0.0862908461371997	False	False	False
M	Partial High School	824	0.0445790954338888	False	False	False
F	Partial High School	757	0.0409543388876866	False	False	False
M	Graduate Degree	1578	0.0853711317896559	False	False	False
F	Graduate Degree	1611	0.0871564596407704	False	False	False
M		9351		False	True	False
F		9133		False	True	False
		18484		True	True	True

Summary

Summarize is another DAX function that can be used to create an aggregated table in Power BI. This function can have advanced features of controlling totals and subtotal with some extra options. You have seen some examples of using Summarize just for grouping, with aggregation, and also using RollUp, RollUpGroup, and IsSubTotal functions. The Summarize function can be used to create a virtual table or a calculated table in Power BI, however, the first one is the one that is used a lot inside measures for dynamic calculation's purposes.

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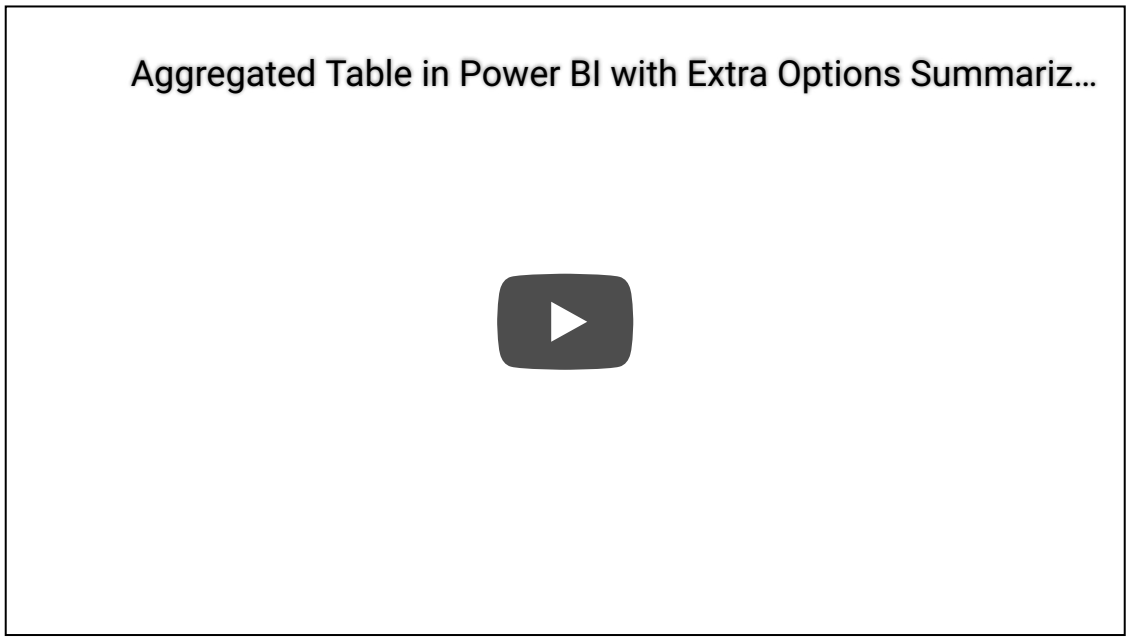

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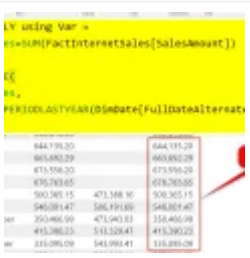

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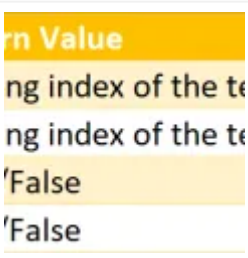

Find a Text Term in a Field in Power BI

Reza Rad

Trainer, Consultant, Mentor

Reza Rad is a Microsoft Regional Director, an Author, Trainer, Speaker and Consultant. He has a BSc in Computer engineering; he has more than 20 years' experience in data analysis, BI, databases, programming, and development mostly on Microsoft technologies. He is a Microsoft Data Platform MVP for nine continuous years (from 2011 till now) for his dedication in Microsoft BI. Reza is an active blogger and co-founder of RADACAD. Reza is also co-founder and co-organizer of Difinity conference in New Zealand.

His articles on different aspects of technologies, especially on MS BI, can be found on his blog: https://radacad.com/blog.

He wrote some books on MS SQL BI and also is writing some others, He was also an active member on online technical forums such as MSDN and Experts-Exchange, and was a moderator of MSDN SQL Server forums, and is an MCP, MCSE, and MCITP of BI. He is the leader of the New Zealand Business Intelligence users group. He is also the author of very popular book Power BI from Rookie to Rock Star, which is free with more than 1700 pages of content and the Power BI Pro Architecture published by Apress.

He is an International Speaker in Microsoft Ignite, Microsoft Business Applications Summit, Data Insight Summit, PASS Summit, SQL Saturday and SQL user groups. And He is a Microsoft Certified Trainer.

Reza's passion is to help you find the best data solution, he is Data enthusiast.

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